



# REBUILD MASSACHUSETTS

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A MASSACHUSETTS  
DIVISION OF  
ENERGY RESOURCES  
REBUILD AMERICA  
PROGRAM

*Sponsored by the  
United States  
Department of Energy*

## EASTHAM ELEMENTARY SCHOOL

### *Saving Energy Every Day*

*Congratulations to Eastham elementary school.*

On June 19, 2007, the National Energy Education Development (NEED) Project honored the Eastham Elementary School for this year's outstanding energy education project - **S.E.E.D.**

In 1980, NEED began as a one-day celebration of energy education. A Presidential Proclamation pronounced the necessity for comprehensive energy education in our nation's schools, a reduction of our dependence on fossil fuels, and increasing use of renewable energy technologies and energy efficiency. Today, twenty-seven years later, the same message holds true.

Cape Light Compact and Cape Cod Cooperative Extension teamed up with NEED to provide 3rd, 4th, and 5th grade teachers with the tools to teach energy topics. The project is called, ***Plugging Energy into the Classroom.***

Today's students must learn to apply energy technologies to use energy more efficiently, to lessen or eliminate environmental impacts of energy use, and to find new ways to use our energy sources more wisely and economically.

The following is a summary of the project:

*Our after school club, called SEED (Saving Energy Every Day), is studying about energy. It started in early October when we sent out pledges to buy compact fluorescent lights (CFLs). We got back 120 responses.*

*Our teacher (Ms. Brown) and her dad Mr. Rad have a great love for science. Every week we meet on Thursday to learn and do activities that help preserve energy. We also study about kinds of energy and uses. We sell CFLs and the money we make goes to materials for our projects.*

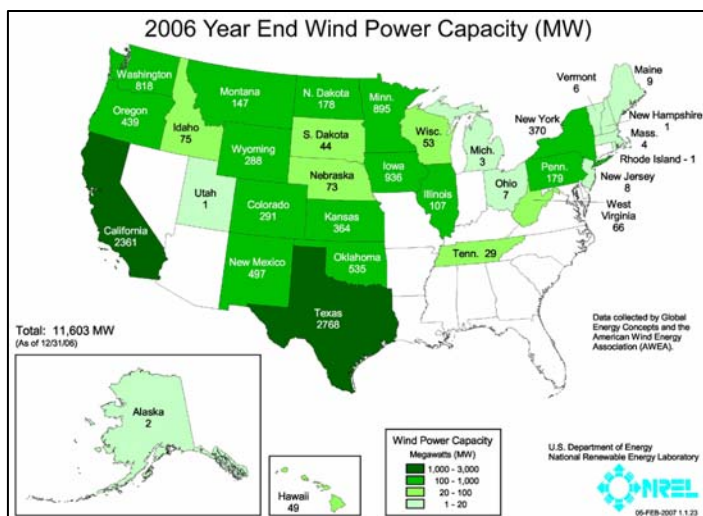
*Over the last two years, we have encouraged our school to recycle. So far this year we have collected 5,852 pounds of recyclable materials from our school. We're going to do this for years to come.*

*Our energy fair had booths open for people to come and see types of energy in action. There were also hands-on activities and experiments for visitors. For fun, we had face painting and the parent's group helped us by supplying us with food.*

This mixed group of third and fourth graders is doing things every day to learn how to preserve energy.

# U.S. DEPARTMENT OF ENERGY ANNUAL REPORT ON U.S. WIND POWER

This report, released in May 2007, analyzes trends in the marketplace, including project costs, turbine sizes, and developer consolidations, with a particular focus on 2006. It is the first in what is envisioned to be an ongoing annual series to provide a detailed overview of developments and trends in the U.S. wind power market.

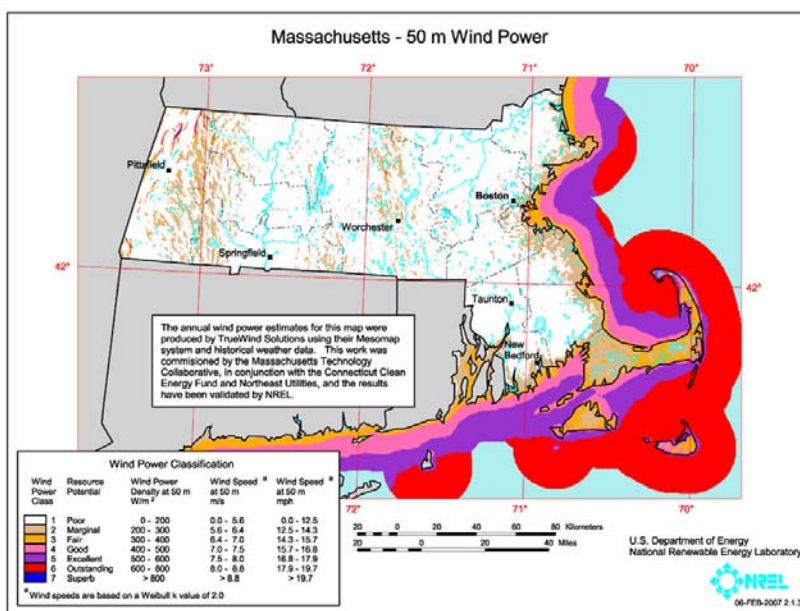


The report notes that U.S. wind power capacity increased by 27 percent in 2006 and that the United States had the fastest-growing wind power capacity in the world in 2005 and 2006. Leading the way in annual capacity growth in the U.S. are Texas, Washington, and California. The report also notes that GE Energy is the dominant wind turbine manufacturer for the U.S. market.

Complete report at

<http://www.nrel.gov/docs/fy07osti/41435.pdf>

This map of Massachusetts shows the wind resource at 50 meters. It indicates that Massachusetts has wind resources consistent with utility-scale production. Excellent-to-outstanding resource is located on the northern part of Cape Cod and good-to-excellent areas are found in the southern part of Cape Cod and along the shore of Martha's Vineyard and Nantucket. Particular ridge crest locations of the Berkshires in western Massachusetts also have excellent wind resource.



For more information on wind technology, go to the [National Renewable Energy Laboratory](http://www.nrel.gov) or U.S. DOE Office of Energy Efficiency and Renewable Energy [Wind & Hydropower Program](http://www.eere.energy.gov).

## MEASURING OPERATION AND MAINTENANCE SAVINGS FOR A PERFORMANCE CONTRACT

When using an energy savings performance contract, capturing the effect of "change" is particularly important as it can have either positive or negative financial impacts. The well-written contract will clearly state which party assumes the financial impact of a change in operating hours, weather, or a change that requires compliance with new or existing standards, etc. This is especially true when measuring savings from **operations and maintenance** (O&M).

A general rule to follow is that any savings claimed from O&M activities (allowed under M.G.L. 25A, 11C) result in **a real decrease in expenditures**. If the ESCO provides future O&M services for a specified fee (effectively stipulating the new cost), the baseline budgets will identify:

- An existing service contract that will be eliminated,
- An existing labor budget if staff reductions are planned,
- Documented expenditures for replacement parts or service calls.

However, savings from O&M measures are difficult to quantify because:

- They are usually not limited to new pieces of equipment where impacts can be isolated and measured.
- Baseline procedures and costs are difficult to quantify, particularly if the current O&M practices are resulting in sub-standard comfort, equipment lives, indoor air quality, etc.

- Valuation of savings may require trade-offs between short-term and long-term benefits and thus may require a long period of evaluation to determine true net benefits.
- Valuation of costs and savings may involve intangibles such as risk and quality of service.

Other than potential cost and savings, a well run O&M has additional impacts.

- Improved indoor air quality.
- Diminish any potential hazard arising from deferred maintenance.
- Optimize equipment performance and expected useful life.

Strategies include:

**Reactive Maintenance;** no effort to maintain equipment.

**Preventive Maintenance;** scheduled maintenance by time or machine-run time

**Predictive Maintenance;** based on the actual condition of the equipment, rather than on some predetermined schedule

**Reliability Centered Maintenance;** process that assesses equipment condition and determines the maintenance requirements<sup>1</sup>

Well-crafted O&M procedures provide positive impacts, however, even the best efforts are doomed to fail unless procedures are implemented and personnel understand and follow them.

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<sup>1</sup> [Federal Energy Management Program, Operation and Maintenance](#)

## RECORD SETTING INVESTMENTS IN RENEWABLE ENERGY AND ENERGY EFFICIENCY

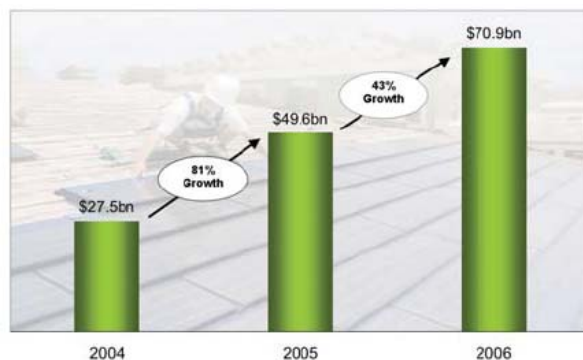
According to the United Nations Environment Program report, *Global Trends in Sustainable Energy Investment*, investments in renewable energy and energy efficiency industries set a new record of more than \$100 billion worth of transactions in 2006.

The upward trend continues in 2007, with \$85 billion forecast for the year.

- Sectors with highest levels of investment are wind, solar and biofuels, reflecting technology maturity, policy incentives, and investor appetite.
- Investors are seeing value creation, with NEX index of clean energy stocks increasing 33% in 2006 and 25% in first quarter 2007.
- Investment is evenly split geographically between US and EU-27, with US companies receiving more technology and private investment, and EU-27 capturing the majority of publicly quoted companies.

- Investment in developing countries is increasing in response to government commitments and supply-chain development.

**Global Investment in Sustainable Energy  
2004-2006**



Note: Grossed-up values based on disclosed deals. The figures represent new investment only, and do not include PE buy-outs, acquisitions of renewable energy projects, nor investor exits made through Public Market / OTC offerings.

Source: New Energy Finance

The US is the largest single destination globally for venture capital and private equity investment. In 2006, venture capital and private equity investors poured \$4.9 billion of new money into clean energy companies and projects in the US.

While the US dominated in venture capital and private equity, EU-27 attracted the most significant public market investment in 2006: \$5.7 billion compared with \$3.5 billion in the US.

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